MCF 3M Opener

For the function;

$f(x) = 2x^2 - 12x - 14$

What are the zeros?
What is the axis of symmetry i.e. x=?
What is the optimum point of this function?

Feb 11-3:37 PM

MCF 3M Opener

For the function;

$f(x) = 2x^2 - 12x - 14$

$= 2(x^2 - 6x - 7)$

$= 2(x^2 - 7x + 1x - 7)$

$= 2(x(x-7) + 1(x-7))$

$= 2(x-7)(x+1)$

AIM: -6, -7, 1, -7

What are the zeros?
What is the axis of symmetry i.e. x=?
What is the optimum point of this function?

$+7, -1$

$\frac{+7 + -1}{2}$

$= \frac{6}{2}$

$= 3$

$x = 3$

$f(3) = 2(3)^2 - 12(3) - 14$

$= 2(9) - 36 - 14$

$= 18 - 50$

$= -32$

Feb 11-3:37 PM

Section 3.3 p 143

Solving Equations by Graphing

Model Rocket
$h(t) = -5t^2 + 15t + 20$

Solution #1
TI83 - 2nd Trace

i) zeros
ii) vertex max/min

(4) zeros
(1.5, 31.25)
h k
20m - initial height

$D = \{t \in R \mid 0 \le t \le 4\}$

$R = \{h(t) \in R \mid 0 \le h(t) \le 31.25\}$

Mar 4-1:56 PM

i) Algebraic

$h(t) = -5t^2 + 15t + 20$

$h(t) = -5(t^2 - 3t - 4)$

AIM: -3, -4; -4, $+1$

$h(t) = -5(t - 4)(t + 1)$

4, -1

$x_v = \frac{4 + -1}{2}$

$= \frac{4 - 1}{2}$

$= \frac{3}{2}$

$= 1.5$

Substitute $x = 1.5$

$h(t) = -5(1.5 - 4)(1.5 + 1)$

$= -5(-2.5)(2.5)$

$= -5(-6.25)$

$= +31.25$

Mar 4-2:17 PM

The rocket reaches its maximum height of 31.25m at 1.5 sec. The rocket hits the ground at 4sec.
The rocket is launched from an initial height of 20m.

Mar 4-2:23 PM

ii)

$x^2 - 8x + 12 = -3$

$x^2 - 8x + 12 + 3 = -3 + 3$

$x^2 - 8x + 15 = 0$

3 & 5 Roots of (-3)

$(3, -3)$ $(5, -3)$

vertex $(4, -1)$

Mar 4-2:25 PM

P147

Oct 4-7:39 AM

$P(t) = 0.5t^2 + 10t + 300$ p147

$P(t)$ = measured in thousands

t = time in years $t = 0$ year 2000

At year 2000 = 300 000

At year $t = 10$ or 2010 = 450 000

Population reaches 1050 or 1 050 000 at year 2030 ($t = 30$)

Mar 4-2:35 PM

$1050 = 0.5t^2 + 10t + 300$

$0 = 0.5t^2 + 10t + 300 - 1050$

$0 = 0.5t^2 + 10t - 750$

The population will reach 1 050 000 at $t = 30$ (or year 2030)

q 2,3,4 odds 5 alt 6, 8, 9 + 10^a

p149-151

Mar 5-10:37 AM

Sep 30-10:28 AM